



***UNITED STATES SPACE COMMAND  
AND  
NORTH AMERICAN AEROSPACE DEFENSE COMMAND***

***NORAD AND USSPACECOM  
JOINT MODELING AND SIMULATION  
ACTIVITIES AND ISSUES***

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**3 JUNE 1999**

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 03-06-1999		2. REPORT TYPE Briefing		3. DATES COVERED (FROM - TO) xx-xx-1999 to xx-xx-1999	
4. TITLE AND SUBTITLE NORAD and USSPACECOM Joint Modeling and Simulation Activities and Issues Unclassified				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Ward, Sam ;				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME AND ADDRESS USSPACECOM and NORAD XXXXX, XXXXXXXX				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS United States Department of Defense Defense Modeling and Simulation Office 1901 N. Beauregard St., Suite 500 Alexandria, VA22311-1705				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT APUBLIC RELEASE					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT ? MISSION EVOLUTION ? INFORMATION WARFARE ? SPACE CONTROL ? ROLES OF MODELING AND SIMULATION ? JOINT M&S ACTIVITIES ? ISSUES					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:		17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19. NAME OF RESPONSIBLE PERSON	
		Public Release	11	Fenster, Lynn lfenster@dtic.mil	
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified		19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 703767-9007 DSN 427-9007	
				Standard Form 298 (Rev. 8-98) Prescribed by ANSI Std Z39.18	



# *OVERVIEW*

- **MISSION EVOLUTION**
  - **INFORMATION WARFARE**
  - **SPACE CONTROL**
- **ROLES OF MODELING AND SIMULATION**
- **JOINT M&S ACTIVITIES**
- **ISSUES**



# ***MISSION EVOLUTION***

- **CURRENT UCP MISSIONS**
  - SPACE CONTROL, FORCE APPLICATION, FORCE ENHANCEMENT, SPACE SUPPORT
- **EVOLVING MISSIONS**
  - SPACE COMBAT, SPACE COMBAT SUPPORT, INFORMATION OPERATIONS
- **HIGHLIGHTS**
  - SPACE CONTROL RECOGNIZED AS AN ESSENTIAL MISSION AREA AND ACTIVITIES MANDATED BY CONGRESS
  - COMPUTER NETWORK DEFENSE RESPONSIBILITIES TO BE ACTIVATED IN OCT 99
- **DIRECTORATE OF ANALYSIS ROLES**
  - **EMPHASIS ON INTEGRATING CAPABILITIES OF THE COMPONENT COMMANDS**
    - NOT THE CLEAR DISTINCTION AMONG LAND, SEA, AIR THAT EXISTS FOR OTHER COMBATANT COMMANDS.
  - **COURSES OF ACTION INCLUDE MITIGATING ANOMALIES IN SATELLITE CONSTELLATIONS**



# ***JOINT M&S ACTIVITIES***

- **JOINT MODELING AND SIMULATION EXECUTIVE PANEL**
- **JWARS USERS' AND REQUIREMENTS GROUPS**
- **IMPLEMENTATION OF DODI 5000.59 AND CJCSI 8510.01**
- **COLLABORATIVE ANALYSIS AMONG COMBATANT COMMANDS AND WITH COMPONENTS**
- **INTERFACE WITH THE TECHNICAL, ANALYTICAL, AND SCIENTIFIC COMMUNITIES**



## ***ROLE OF M&S IN USSPACECOM***

- ***SUPPORT FOR CURRENT SPACE OPERATIONS***
  - SPACE SURVEILLANCE
  - SATELLITE CONTROL
  - MISSION CAPABILITY PREDICTIONS
- ***ASSURANCE THAT REQUIREMENTS ARE FEASIBLE AND EFFECTIVE***
  - CONSTELLATION ARCHITECTURES, COVERAGE/REVISIT, AND C2 ANALYSES
- ***DEMONSTRATING THAT ALLOCATED FORCES ARE SUFFICIENT (OR NOT)***
- ***COMMAND, CONTROL, AND COMMUNICATIONS ANALYSES***
  - DETAILED MODELS OF COMBINED SPACE AND TERRESTRIAL NETWORKS
  - DETAILED MODELS OF STRATEGIC WARNING AND DEFENSE
- ***EXTENSIVE M&S OF THEATER MISSILE WARNING AND DEFENSE***



# *USSPACECOM M&S APPLICATIONS AND ADVANCES*

- **OPERATIONAL FRAMEWORK TO GUIDE M&S**
- **COLLABORATION WITH DISA**
- **COLLABORATION WITH THE NRO**



## *APPROACH TO INCORPORATING SPACE INTO JWARS, JSIMS, AND THE QDR*

- **INTERACTIONS BETWEEN SPACE AND TERRESTRIAL SYSTEMS WELL REPRESENTED IN OPORD 3500-XX AND SUPPORTING FRAGMENTARY ORDERS**
- **PARTICIPATION IN DEVELOPING USE CASES FOR JWARS BETA RELEASE WOULD HELP TEST AND ESTABLISH LINKAGES**
- **COLLABORATION WITH DESIGNATED TEST SITES TO ESTABLISH ROE FOR AUGMENTING JWARS WITH SUPPORTING MODELS AND SUBJECT MATTER EXPERTISE.**





# ***ROLE OF M&S IN NORAD***

- **FORCE STRUCTURE ARCHITECTURES AND COURSES OF ACTION**
- **UNKNOWN TRACK ANALYSIS AND DATA BASES**
- **SENSOR COVERAGE AND EFFECTIVENESS**
- **COMMAND, CONTROL, AND COMMUNICATIONS ASSESSMENTS**
- **BALLISTIC MISSILE WARNING AND DEFENSE ANALYSES**
- **COLLABORATIVE STUDIES WITH CANADA**
  - **CANADIAN SPACE STUDY**



## *NORAD M&S APPLICATIONS AND ADVANCES*

- **ALTERNATIVE SURVEILLANCE ARCHITECTURES**
- **NATIONAL MISSILE DEFENSE KILL ASSESSMENT**



# ***NORAD AND USSPACECOM M&S NEEDS***

- **LINKS WITH CAMPAIGN MODELS**
- **OPERATIONAL PROCESS REPRESENTATIONS**
- **RESOURCES**



# *ISSUES*

- **CLASSIFICATION**
  - **SOME VERY COMPETENT MODELS NOT GENERALLY ACCESSIBLE**
- **FUNDING, ROLES, AND MISSIONS**
  - **SERVICE MODELS MUST REFLECT SERVICE BIASES AND INTERESTS**
    - **DIFFICULT TO REPRESENT OTHER SERVICES' CAPABILITIES OBJECTIVELY**
  - **JWARS SCHEDULE AND FUNDING LIMITATIONS PRECLUDE ADDITIONAL "THREADS" AND REPRESENTING ADDITIONAL SYSTEMS**
- **ENDURING EXPERTISE**
  - **DECLINING ANALYTICAL CAPABILITY AMONG THE UNIFIED COMMANDS**